

Patent Claims

1. Microlithography projection objective with a numerical aperture on the image side equal to or larger than 1.0, containing at least one lens of a crystal material from the group that comprises NaCl, KCl, KJ, NaJ, RbJ, CsJ, MgO, $MgAl_2O_4$ and $Y_3Al_5O_3$.
2. Microlithography projection objective according to claim 1, characterized in that the last curved lens on the image side consists of one of the crystal materials named.
3. Microlithography projection objective according to claim 1 or claim 2, characterized in that the numerical aperture on the image side is more than 1.40, preferably more than 1.65, and with special preference more than 2.0.
4. Microlithography projection objective according to at least one of the preceding claims, characterized in that at least one lens of one of the named crystal materials has a moisture protection coating.
5. Microlithography projection objective according to at least one of the preceding claims, characterized in that a plurality of lenses consist of one of the crystal materials named, preferably of different ones, and that the index of refraction at an operating wavelength is highest for the lens that is arranged nearest to an image plane of the projection objective.

6. Microlithography projection objective according to at least one of the preceding claims, characterized by being configured as an immersion objective.

5 7. Microlithography projection objective according to at least one of the preceding claims, characterized by being configured as an optical-near-field objective.

10 8. Microlithography projection objective according to at least one of the preceding claims, characterized by having an operating wavelength from the group comprising 248 nm, 193 nm and 157 nm.

15 9. Microlithography projection objective according to at least one of the preceding claims, characterized in that at least one of the lenses of one of the crystal materials named is composed of at least two lens components that are oriented with different crystallographic orientations.

20 10. Microlithography projection objective according to at least one of the preceding claims, characterized in that at least one lens is composed of a plurality of components and that at least one of said components consists of a crystal material according to claim 1.

25 11. End plate of a microlithography projection objective, consisting of crystalline magnesium oxide which can be overlaid with a coating.

30 12. Microlithography projection objective with an end plate according to claim 11, in particular with the features of at least one of the claims 1 to 10.

13. Use of lens components made of crystalline material with a refractive index of more than 1.55, preferably more than 1.6, in an objective of a projection system conforming preferably to one of the preceding claims, characterized in that at least two of said lens components made of different crystalline materials are used in said objective.

10 14. Microlithography projection system with a microlithography projection objective according to at least one of the claims 1 to 10 and 12, or involving the use of lens components according to claim 13.